Status on Spoke Resonators R&D for two European Projects: XADS and Eurisol

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The IPN (Institut de Physique Nucleaire-CNRS) is currently working on the design of linear accelerators for two european projects: XADS and Eurisol. XADS is an eXperimental Accelerator Driven System for nuclear waste transmutation. Eurisol is a nuclear physics facility for radioactive beams using the ISOL technique. Both projects have received the support of the European Commission, coordination structures and design working groups are currently at work with an active participation of many european laboratories and industrial firms. R&D activities have progressed in several laboratories and a coordinated R&D program is planned for the next four years.

The proposed characteristics of these accelerators are very close: proton beams with an energy in the range of 600 MeV – 1 GeV, an intensity in the range of 5 – 10 mA, and CW operating mode. The present proposal is a linear accelerator using superconducting elliptical cavities for the high energy sections (> 100 MeV). For the intermediate energy sections of the accelerator (5/10 MeV to 100 MeV), the IPN-Orsay proposes to use spoke resonators. A study program was decided last year. Detailed studies on beam dynamics, RF structure, and mechanical design have been developped in the last period. A first spoke Nb prototype (β=0.35) has been recently constructed, and the test program has recently started. Several other resonators with β values in the range 0.15 to 0.35 are planned in the short term.